

WHAT IS CLAIMED IS:

1. A method comprising:
maintaining a copy of a data change log at a primary node, wherein
said data change log at said primary node is associated with a primary data
volume of said primary node, and
said copy of said data change log is maintained at a data recovery node;
detecting a failure of said primary data volume; and
updating a secondary data volume of a secondary node using said copy of said data
change log in response to said detecting.
2. The method of claim 1, wherein said maintaining comprises:
maintaining a real-time copy of said data change log at said primary node.
3. The method of claim 2 further comprising:
replicating data to be written to said primary data volume from said primary node to
said secondary node.
4. The method of claim 3, wherein said maintaining said real-time copy comprises:
receiving a request to perform a write operation on said primary data volume;
storing data associated with said write operation substantially simultaneously on said
data change log and said real-time copy of said data change log in response to
said receiving.
5. The method of claim 3, wherein said replicating comprises:
replicating said data to be written to said primary data volume to said secondary data
volume.
6. The method of claim 3, wherein said replicating comprises:
asynchronously replicating said data to be written to said primary data volume to said
secondary data volume.
7. The method of claim 3, wherein said updating comprises:
receiving a manual update initiation indication; and
updating said secondary data volume using said real-time copy of said data change
log in response to said receiving.

8. The method of claim 3, wherein
said real-time copy of said data change log comprises a plurality of entries; and
said updating comprises:
 - identifying an entry of said plurality of entries as corresponding to an
incomplete write operation on said primary data volume, and
updating said secondary data volume using said entry.
9. The method of claim 3, wherein said updating comprises:
copying a block of data from said real-time copy of said data change log to a staging
log at said secondary node, said block of data comprising a plurality of entries;
applying each of said plurality of entries to a data change log at said secondary node
in response to said copying; and
updating said secondary data volume using said data change log at said secondary
node.
10. The method of claim 3, further comprising:
detecting a recovery of said primary data volume; and
resynchronizing said primary data volume and said secondary data volume in
response to said detecting.
11. A machine-readable medium having a plurality of instructions executable by a
machine embodied therein, wherein said plurality of instructions when executed cause said
machine to perform a method comprising:
 - maintaining a copy of a data change log at a primary node, wherein
said data change log at said primary node is associated with a primary data
volume of said primary node, and
said copy of said data change log is maintained at a data recovery node;
 - detecting a failure of said primary data volume; and
updating a secondary data volume of a secondary node using said copy of said data
change log in response to said detecting.
12. The machine-readable medium of claim 11, wherein said maintaining comprises:
maintaining a real-time copy of said data change log at said primary node.

13. The machine-readable medium of claim 12, said method further comprising:
replicating data to be written to said primary data volume from said primary node to
said secondary node.
14. The machine-readable medium of claim 12, wherein said maintaining said real-time
copy comprises:
receiving a request to perform a write operation on said primary data volume;
storing data associated with said write operation substantially simultaneously on said
data change log and said real-time copy of said data change log in response to
said receiving.
15. The machine-readable medium of claim 12, wherein said replicating comprises:
asynchronously replicating said data to be written to said primary data volume to said
secondary data volume.
16. The machine-readable medium of claim 12, wherein said updating comprises:
receiving a manual update initiation indication; and
updating said secondary data volume using said real-time copy of said data change
log in response to said receiving.
17. The machine-readable medium of claim 12, wherein
said real-time copy of said data change log comprises a plurality of entries; and
said updating comprises:
identifying an entry of said plurality of entries as corresponding to an
incomplete write operation on said primary data volume, and
updating said secondary data volume using said entry.
18. The machine-readable medium of claim 12, wherein said updating comprises:
copying a block of data from said real-time copy of said data change log to a staging
log at said secondary node, said block of data comprising a plurality of entries;
applying each of said plurality of entries to a data change log at said secondary node
in response to said copying; and
updating said secondary data volume using said data change log at said secondary
node.

19. A data processing system comprising:
means for maintaining a copy of a data change log at a primary node, wherein
said data change log at said primary node is associated with a primary data
volume of said primary node, and
said copy of said data change log is maintained at a data recovery node;
means for detecting a failure of said primary data volume; and
means for updating a secondary data volume of a secondary node using said copy of
said data change log in response to a failure of said primary data volume.
20. The data processing system of claim 19, wherein said means for maintaining
comprises:
means for maintaining a real-time copy of said data change log at said primary node.
21. The data processing system of claim 20, further comprising:
means for replicating data to be written to said primary data volume from said
primary node to said secondary node.
22. The data processing system of claim 21, wherein said means for maintaining said real-
time copy comprises:
means for storing data associated with a requested write operation on said primary
data volume substantially simultaneously on said data change log and said
real-time copy of said data change log.
23. The data processing system of claim 21, wherein said means for replicating
comprises:
means for asynchronously replicating said data to be written to said primary data
volume to said secondary data volume.
24. The data processing system of claim 21, wherein said means for updating comprises:
means for updating said secondary data volume using said real-time copy of said data
change log in response to a manual update initiation indication.

25. The data processing system of claim 21, wherein
said real-time copy of said data change log comprises a plurality of entries; and
said means for updating comprises:
means for identifying an entry of said plurality of entries as corresponding to
an incomplete write operation on said primary data volume, and
means for updating said secondary data volume using said entry.
26. The data processing system of claim 21, wherein said means for updating comprises:
means for copying a block of data from said real-time copy of said data change log to
a staging log at said secondary node, said block of data comprising a plurality
of entries;
means for applying each of said plurality of entries from said staging log to a data
change log at said secondary node; and
means for updating said secondary data volume using said data change log at said
secondary node.
27. A data processing system comprising:
a storage element to store a copy of a data change log at a primary node, wherein
said data change log at said primary node is associated with a primary data
volume of said primary node; and
a recovery module configured to update a secondary data volume of a secondary node
using said copy of said data change log in response to a failure of said primary
data volume.
28. The data processing system of claim 27, wherein said storage element comprises:
a storage element to store a real-time copy of said data change log at said primary
node.
29. The data processing system of claim 28, further comprising:
a volume management module configured to mirror data to be written to said data
change log to said real-time copy of said data change log.
30. The data processing system of claim 28, further comprising:
a volume replication module configured to synchronously replicate data to be written
to said data change log to said real-time copy of said data change log.

31. The data processing system of claim 28, wherein said real-time copy of said data change log comprises a plurality of entries; and said recovery module comprises a failover management module configured to identify an entry of said plurality of entries as corresponding to an incomplete write operation on said primary data volume and update said secondary data volume using said entry.
32. The data processing system of claim 28, wherein said recovery module comprises: a failover management module configured to copy a block of data comprising a plurality of entries from said real-time copy of said data change log to a staging log at said secondary node.
33. The data processing system of claim 28, wherein said primary node comprises a volume replication module configured to replicate data to be written to said primary data volume to said secondary node.
34. The data processing system of claim 33, wherein said volume replication module comprises a volume replication module configured to asynchronously replicate data to be written to said primary data volume to said secondary data volume.
35. A method comprising:
maintaining a copy of a data change log at a primary node, wherein
said data change log at said primary node is associated with a primary data volume of said primary node, and
said copy of said data change log is maintained at a data recovery node;; and
replicating data to be written to said primary data volume from said primary node to said secondary node.
36. The method of claim 35, wherein said maintaining comprises:
maintaining a real-time copy of said data change log at said primary node.
37. The method of claim 36, further comprising:
detecting a failure of said primary data volume; and
updating a secondary data volume of said secondary node using said real-time copy of said data change log in response to said detecting.